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HORTICULTURE IN THE SCHOOL.

II.

THE purposes of the school garden are especially to develop an interest in flowers, to afford practical instruction in caring for them, to serve as an example and stimulus for the home gardens of the pupils, and to diffuse knowledge of the laws and processes of vegetable growth. There lies in the background the thought of a better agriculture brought to pass through this agency, and the richer individual life that finds delight in the appreciation of natural beauty.

To secure the best results all features of the garden must contribute to these ends. There must be system and harmony in the position and arrangement of the garden with reference to the surroundings of the school. It is impossible to lay down many rules of universal application. So much depends upon the available space, the position of the shade trees, the slope of the land. There must be a playground for the children upon which not even a school garden should encroach. We have rejoiced in the recent revival of interest in tree-planting about school premises ; yet it is possible to plant too many trees ; to plant them too near the building, or to spoil the effect by wrong location. The school premises should resemble a picture, the building near the center surrounded by open spaces bordered by trees and banks of shrubbery, or tall flowering plants. With the exception of the row lining the street in front, most of the trees should be grouped in the remoter portions of the grounds. In irregular masses about the border, care being taken to keep the taller in the rear, may be planted, lilacs and forsythias, syringas, spiræas, weigelas, and japonicas, flowering almonds, althea, hydrangea, and deutzia, and flowering currants. A few scattering shrubs will not suffice. They should be planted close enough to produce mass effects. A portion of the outskirts of the grounds should be set apart for hardy border plants, perennials that once

established will hold their own with little attention. Peonies, dicentras, aquilegias, phloxes, lilies, irises, and coreopsis, hollyhocks, and rudbeckia will maintain a succession of bloom all summer long about the empty school house. The greater part of the garden must be devoted to annuals and experimental beds. Yet even these should be arranged with reference to general effect as viewed from the front. Strong growers with rank foliage, cannas, sunflowers, castor beans, must stand well to the margin. Tall spikes of flowers upon comparatively naked stems like the amaranth and gladiolus may stand well in the foreground. Generally more pleasing effects are secured by massing each variety, rather than by scattering them among different species,

In beginning a school garden most of the planting must be done in the spring, yet there is much to do in the fall. The plan should be carefully worked out, the sod broken up, and the ground partially prepared for the spring planting. Seeds may be gathered or ordered early from some reliable seedsman. After the garden is once established the gathering and labeling of seeds will receive conspicuous attention.

A few bulbs, crocuses, tulips, hyacinths, should be planted for early spring flowering. The ground should be thoroughly pulverized to a good depth. The bulbs may be planted at any time before November 15. September plantings usually yield best results. The teacher should secure a few four-inch pots and instruct the pupils in the mode of preparing hyacinths and narcissi for winter flowering. Unless the school house boasts of a cellar which does not freeze, it will be necessary to take these to the homes of the pupils for development.

In the fall, too, many seeds should be planted—peach pits to be budded in the following September, apple seeds to produce stocks for grafting, and especially nuts and acorns, whether it is desired merely to study their mode of germination, or to grow trees. These trees with long tap-roots do not bear transplanting well. In many parts of the middle west, nut trees are growing scarce. Walnuts, butternuts and shell-bark hickories should be planted abundantly along roadsides, whenever the soil is suitable. As far north as the forty-first parallel in rich soils the pecan is pre-

eminently the tree to plant ; it is a vigorous grower, clean-limbed, symmetrical, and beautiful ; and at the present prices of the nuts no field or orchard crop can yield a better return for the ground it occupies. If nuts of northern growth are planted, the trees will yield abundantly and the crop will mature.

In the fall months the teacher will start a window garden in pots and window boxes in the south windows of her schoolroom, not so much as an end in itself as a means of instructing the children in the care of their own houseplants. The lessons should deal with such questions as these: the proper admixture of loam and sand or leaf-mold for different species ; the use of broken brick or fragments of pottery to insure proper drainage ; how often and how freely plants should be watered ; the various modes of repotting plants of different ages ; the varying amount of sunlight required by different plants ; showering or bathing plants to free them from the dust of the schoolroom ; how to destroy the red spiders, the green lice, the scales and mealy bug, that infest houseplants ; how to propagate petunias, geraniums, salvias, and coleuses by cuttings. The varieties chosen for the schoolroom must depend upon the exposure, the mode of heating the building, and to some extent upon the age of the pupils instructed. In rural schools it will be necessary to carry them all to the homes of the pupils by the end of November. The dust and extremes of temperature that usually prevail in city schools suggest that even for them only vigorous and hardy species be selected. Geraniums, salvias, lantanas, ageratum, and heliotrope grow freely and bloom abundantly with any sort of treatment. A large pot of double white petunias will fill the air with fragrance. These are all readily propagated by cuttings. A Chinese primrose may be bought of the florist. Bulbs of the pink oxalis may be started at almost any season and will bloom profusely. A basket of asparagus sprengerii should hang before the window. Kenilworth ivy may be substituted at a north window. Begonias and sword ferns may be kept in rooms where direct sunlight never enters.

In March the teacher may place in the south or east windows a few shallow starting boxes for annuals. Asters, calliopsis,

petunias, phloxes, zinnias, and salvias, will be ready for transplanting to the school garden or to the private gardens of the pupils early in May. The inexperienced teacher must be prepared for failure in this work. Poor seed, wrong temperature, too much or too little water, earth worms that devour the young seedlings, the "damps" that may cause a flourishing plantation to vanish in a few hours, are only part of the difficulties that vex the soul of the amateur florist.

At this time, when the warming sunshine develops every latent interest in plant life, the pupils should make an experimental study of germination to discover the conditions of light, heat, and moisture most favorable to different plants. Our recent text-books in botany describe experiments of this character, as well as numerous simple devices for illustrating the effects of drainage, the value of a dust mulch in retaining soil moisture, the importance of soluble nitrates to the growing plant. There is no rural school so unhappily conditioned as to render all of this work impracticable. Nothing else is so potent in awakening an interest in scientific agriculture, for nothing else so clearly reveals man's power to alter and control the vital conditions of plant development.

Early in April, or as soon as the ground is dry enough, spring work in the school garden may begin. The border of shrubs and hardy perennials must be planted before the buds start. Sweet peas are planted, soon to be followed by nasturtiums, and after May 1, by poppies, escholtzia, balsams, marigolds, amaranths, verbenas, portulacca, sweet alyssum, and other annuals. Pupils will bring in from the woods anemones, spring beauties, blue bells, painted cup, trilliums, violets, and spiderwort. When in full flower is not the best time to transplant; yet these may be kept alive with some care, if enough soil is carried with the roots. In rural and village schools it is not best to give much space in the school garden to ordinary field crops and garden vegetables. A few radishes may be sown to show the effect of topping the leaves upon root development. Peanuts, cotton, okra, mimosas, and other unfamiliar plants of peculiar habits of growth or high commercial importance may properly find a space.

Children may be instructed in the care of tools and in the operations of transplanting, hoeing, and weeding; they may be shown the conditions under which a clay soil may be properly worked and the need of maintaining a soil mulch during dry weather. If the space is ample it is well to charge each pupil with the care of some portion of the garden under the direction of the teacher; but he should not plant as he pleases, nor assert exclusive property in the plot assigned, nor lose his sense of joint ownership in the whole garden. In the home garden there will be opportunity for spontaneity.

The unskilled teacher in search of information will derive great benefit from the study of the seed catalogues of our leading florists. The writer has always found florists a very pleasant class of men to cultivate. They are invariably men of superior intelligence, so devoted to their profession that they are willing to make no small sacrifice of time and means in the promotion of any enterprise that promises to foster the love of flowers. The best books which the writer has read are: *Flowers*, by Eben Rexford (published by Penn Publishing Co.), 50 cents. *The Nursery Book*, L. H. Bailey (The Macmillan Co.), \$1.00. *Garden Making*, L. H. Bailey (The Macmillan Co.), \$1.00.

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